

OPTICAL SMOKE DETECTOR



Product Overview	
Product Type	Optical Smoke Detector
Part No.	DS-OD01 (non-isolated)
	DS-OD01 (isolated)
Digital Communication Protocol	Discovery & CoreProtocol® compatible

Product Information

The Optical Smoke Detector uses new optical sensing technology, PureLight™, to detect smoke particles entering the chamber. PureLight marks a new stage in the development of Discovery optical technology and aims to reduce the possibility of false alarms whilst increasing the reliability of detection of a real fire

- PureLight optical technology reduces false alarms and enhances smoke recognition
- Easy access, front reset mechanism
- Utilises digital CoreProtocol communications
- Ergonomic reset key
- Compatible with Discovery systems*170° viewable LED
- Mechanically compatible with existing bases
- Available with or without integrated switchable isolator
- Drift compensation
- Tri-coloured LED status indicator
- Polycarbonate housing for colour stability and strength
- Comprehensively tested to exceed EN 54-7 standard
- FasTest® for quicker testing of detectors
- Card addressing
- Locking mechanism (grub screw)

*Note: Not all features are available when devices are connected to an Discovery fire control panel

Technical Data	
All data is supplied subject to change without notice. Specifications are typical at 24V, 25°C and 50% RH unless otherwise stated.	
Detection principle	Photo-electric light scattering
Sensor configuration	Chamber with surface-mount infrared emitter and prism. Solid state integrated photo-diode and amplifier.
Sampling frequency	Once per second
Terminal functions (note: L1 & L2 are polarity sensitive)	+L2 Loop in & out positive -L1 in Loop (isolated) negative -L1 out Loop (isolated) negative +R Remote indicator positive connection (internal connection to positive) -R Remote indicator negative connection (4.7mA maximum)
Supply voltage (Vmin-Vmax)	17-35V DC
Digital communication protocol	CoreProtocol, Discovery compatible 5-13V peak to peak
Quiescent current	Isolated detector: 350µA Non-Isolated detector: 300µA
Power-up surge current	560µA
Maximum power-up time	10s
Alarm current, LED illuminated	3.5mA
Isolated detector data only	
Maximum loop current (ICmax; L1 in/out)	1A
Maximum series resistance (ZCmax; L1 in/out)	80m
Maximum switch current (ISmax; L1 in/out)	3A
Maximum leakage current (ILmax; during isolation)	33mA (100ms pulse every 2s)
Isolation voltage (VS0min-VS0max)	12.5-15V DC
Reconnect voltage (VSCmin-VSCmax)	12.8-19.1V DC
Clean-air analogue value	23 +4/-0
Alarm level analogue value	55
Status indicator	Alarm Red Fault Flashing Yellow Isolate Yellow Poll Green
Operating temperature	-40°C to 70°C
Humidity	0% to 95% RH (no condensation or icing)
Effect of atmospheric pressure	None

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Technical Data		
Effect of wind speed	None, tested up to 10m/s	
Vibration, impact and shock	EN 54-7	
IP Rating	IP44	
Standards & approvals	SA5000-600 EN 54-7, CPR & LPCB	SA5100-600 EN 54-7, EN 54-17, CPR & LPCB
Dimensions	100mm diameter x 36mm height (48mm height with Intelligent Mounting Base)	
Weight	83g	
Materials	Housing: White polycarbonate UL94-V0 Terminals: Tin plated stainless steel	

Electrical Considerations

The detector is designed to be connected to a two-wire loop circuit carrying both data and power. A version with a short-circuit isolator integrated into the detector head is also available.

Operating Principles

The low profile design of the Optical Smoke Detector is sleek and evolutionary, with a 360° LED indicator which illuminates red when in alarm, yellow to indicate a fault and green to indicate protocol activity.

At the heart of the Discovery detector is PureLight Sensing Technology which incorporates:

- Cone technology combined with a high-intensity infra-red LED to provide stability and accurate sensitivity to smoke
- A photo-diode and an amplifier integrated into an Application-Specific Integrated Circuit (ASIC)
- 'Serpentine' pathway designed to provide a barrier against dust and insect ingress
- A sophisticated dynamic algorithm, providing transient rejection and compensation for drift whilst maintaining accurate sensitivity

The sensitivity mode of operation of this processing is selected at the fire control panel (see Table 1).

Table 1 Optical Smoke Detector operating modes

Mode	Response Value		Minimum Time to Alarm
	%/m*	dB/m**	Seconds
1	1.4	0.10	5
2	1.4	0.10	30
3	2.1	0.14	5
4	2.1	0.14	30
5	2.4	0.16	5

* Tested in grey smoke

** Tested in oil mist to EN 54-7 standard

Application

Fire detectors should always be installed in accordance with all local and national laws and codes of practice.

Optical smoke detectors are recommended for general use, particularly where there is a risk of slow burning fires or where the development of smoke could become the major hazard.

Device Addressing

A universal card is supplied with all Intelligent Mounting Bases. Using a coding guide, pips on the card are removed to set the address of the detector. This simplifies and speeds up installation, commissioning and maintenance. The address location remains the same no matter how often detectors are replaced.

When devices are used with CoreProtocol, device auto-addressing can be enabled by fire control panels that have been designed to incorporate this feature.

Communication

Device uses the new digital CoreProtocol to allow more advanced control and configuration, whilst maintaining backwards compatibility with previous generations of Discovery products. Discovery and CoreProtocol make use of the Normal, Read and Write modes with additional non-volatile data fields made available to the fire control panel.

Backward Compatibility

Detectors have been designed to operate Discovery loops. This allows for detectors and bases to operate on existing systems and for detectors to operate on Discovery bases (Intelligent Mounting Base). It should be noted that not all features of the device will be available when used with Discovery fire control panels. If detectors are used with Discovery fire control panels incorporating drift compensation algorithms, these must be disabled when communicating with Discovery devices.

When detectors are used with an Intelligent Mounting Base on a CoreProtocol system, devices will have a +128 address offset due to only 7 address pips being available on the card. For example, an card set at 32 will address as 160 on CoreProtocol with detectors.

